CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A computer implemented collaborative engineering environment (CEE) for providing an inter-enterprise collaborative mechanism for organizations developing and maintaining complex system products, the CEE providing a federated architecture linking multiple systems and applications together to enable collaboration among enterprise members, comprising:

a database defined by an associative information model for providing a persistent understanding of product and program information, assets and tools available in the enterprise;

an information management service providing controlled access to the database for collaboration and;

an information transformation service receiving, sending and formatting data and acting as a bi-directional link between the database and members of the enterprise, wherein access to the data in the database is managed by the information management service, and wherein the information transformation service provides information structuring, and information mapping and exchange for domain-specific tools; and

at least one domain user interface linking members of a domain in the enterprise with information in the database, wherein the information available to each member is information necessary for the member to complete role and team based tasks, and wherein a domain user interface comprises access to at least one domain-specific tool, wherein each tool communicates information with the database via the information transformation service,

wherein members have immediate access to data generated by any

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member of the enterprise, as authorized by the associative information model defining database access and control.

2. A CEE as recited in claim 1, wherein each member communicates with the enterprise for collaboration using a standard web interface, the web interface being customized for programs, roles and teams.

3. A CEE as recited in claim 1, wherein the information management service provides access control, security, search mechanisms, concurrency control, and versioning for data in the database.

4. A CEE as recited in claim 1, wherein the CEE is built with a layered software architecture comprising a database management system (DBMS), a product data management system (PDM) augmenting the DBMS with engineering specific information management capabilities, and the information transformation service utilizes an extensible infrastructure for interfacing engineering or management applications into the PDM environment.

5. A CEE as recited in claim 1, wherein data in the database have a corresponding program identifier, thereby allowing multiple programs within the enterprise to access a same CEE.

6. A CEE as recited in claim 1, wherein the CEE sends/receives information to users in a domain area, the domain area not being implemented in the collaboration environment.

7. A CEE as recited in claim 6, wherein the database associative information model defines data for domain areas unintegrated into the CEE by a domain user interface.

8. A CEE as recited in claim 1, wherein the CEE is implemented using client/server technology, the database and information management services being on a server and domain user interfaces being on at least one client, and tools required by a domain being on one or both of the client and server.

9. A CEE as recited in claim 1, wherein a domain user interface is implemented for one or more domain areas in the group of proposal teams, program management, system engineers, software developers, hardware developers, system integrators, testing and integration engineers, support engineers, sub-contractors, teammates, suppliers and partners, users and customers.

10. A CEE as recited in claim 1, wherein the database is object-oriented, facilitating reuse of standard elements among programs and organizations within the enterprise.

11. A CEE as recited in claim 1, wherein the associative information model is developed from a life cycle perspective of implemented domain models, each domain model overlaying system views (functional, physical, operational) and system schedules (development, production, technology refreshment/insertion, support, platform availability) with the program infrastructure (development, production, support), and wherein the domain models define relationships and standard parameters dynamically modifiable for multiple programs, projects, or teams.

12. A method for implementing and using a computer implemented collaborative engineering environment, said method comprising:

specifying and documenting an associative information model for

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an enterprise to capture physical, functional and environmental system requirements, wherein domain experts provide input into the specifying step for their particular domain;

mapping the captured requirements into a database schema for a product data management system (PDM);

generating an information transformation service between data to be stored in a database managed by the product data management system and tools used by domain specialists in performance of domain tasks, wherein information is stored in the database by various members of the enterprise based on the associative information model for the various member's domain area;

accessing data in the database by members of the enterprise, wherein the data accessed is part of a current baseline and the data retrieved is current for all members accessed the data; and

performing domain tasks by a member of the enterprise using domain specific applications, wherein results from the domain specific application are properly formatted by the information transformation service and stored in the database managed by the PDM, the data being immediately accessible to other members of the enterprise.

13. A method as recited in claim 12, wherein the CEE enables immediate information exchange in the access step for one or more domains in the group of proposal teams, program management, system engineers, software developers, hardware developers, system integrators, test and integration engineers, support engineers, teammates, partners, subcontractors, suppliers, users, and customers.

14. A method as recited in claim 13, wherein the access step uses a customizable standard web-based interface to provide members of the enterprise access to collaborative information.

15. A method as recited in claim 14, wherein the standard web-based interface utilizes dynamic Hypertext Markup Language (HTML) generation for program customization.

16. A computer implemented web-centric collaborative engineering environment (CEE) implemented using client/server technology for providing an inter-enterprise collaborative mechanism for organizations developing, integrating or maintaining complex system products, the CEE providing a federated architecture linking multiple systems and applications together to enable collaboration among enterprise members, comprising:

an object oriented database facilitating reuse of standard elements among programs and organizations within the enterprise, the database residing on a server computer and defined by an associative information model, and augmented with engineering specific information management capabilities for providing a persistent understanding of product and program information, assets and tools available in the enterprise, wherein the associative information model defines physical, functional and operational attributes of elements within at least one domain area in the enterprise and relationships among the elements include a corresponding program, role or team;

an information management service residing on a server computer providing controlled access to the database for collaboration using an access control scheme defined by policies of the enterprise, the information management service using an object oriented database management system for access and control of the database and;

an information transformation service utilizing an extensible infrastructure to interface engineering or management applications used in a domain into the CEE environment and acting as a bi-directional link, the

information transformation service receiving, sending and formatting data between the database and members of the enterprise, wherein access to the data in the database is managed by the information management service, and wherein the information transformation service provides information structuring, and information mapping and exchange for domain-specific tools; and

at least one domain user interface residing on at least one client computer linking members of the enterprise with information in the database, wherein the information available to each member is information necessary for the member to complete role and team based tasks, and wherein a domain user interface allows a member access to at least one domain-specific tool, wherein each tool communicates necessary information with the database via the information transformation service, and wherein an implemented domain user interface is customized for a domain area in the group of proposal teams, program management, system engineers, software developers, hardware developers, system integrators, testing and integration engineers, support engineers, sub-contractors, teammates, suppliers and partners, users and customers,

wherein domain members have immediate access to data generated by any member of the enterprise, regardless of domain, as authorized by the associative information model defining database access and control and controlled by the information management service, and each member communicates with the enterprise for collaboration using a standard web interface, the web interface being customized for programs, roles and teams.

17. A CEE as recited in claim 16, wherein data in the database have a corresponding program identifier, thereby allowing multiple programs within the enterprise to access a same CEE.

18. A CEE as recited in claim 16, wherein the CEE sends/receives information to users in a domain area, the domain area not being implemented in the collaboration environment.

19. A CEE as recited in claim 16, wherein the database associative information model defines data for domain areas unintegrated into the CEE by a domain user interface.

20. A CEE as recited in claim 16, wherein the information transformation service performs some tasks on the server and some tasks on at least one client.

21. A CEE as recited in claim 16, wherein the associative information model is developed from a life cycle perspective of implemented domains models, each domain model overlaying system views and system schedules with the program infrastructure for development, production or support, and wherein the domain models define relationships and standard parameters dynamically modifiable for multiple programs, projects, or teams.

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